

WHAT IS CLAIMED IS:

1. An image producing device comprising:

5 a frame acquisition module acquiring a plurality of sets of frame information from video information, wherein the video information comprises numerous sets of frame information, and the frame information expresses images as halftone data for numerous individual pixels;

10 a deviation amount acquisition module acquiring rotation amount information on the basis of the plurality of sets of frame information, wherein the rotation information expresses the rotational deviation among images expressed by the plurality of sets of frame information;

15 a conversion module converting at least one of the plurality of sets of frame information so that the rotational deviation among images is reduced by rotating at least one of the respective images expressed by the plurality of sets of frame information on the basis of the acquired rotation amount information; and

20 a synthesizing module producing image data by synthesizing a plurality of sets of frame information on which the conversion processing has been performed, wherein the image data expresses images in halftones by means of numerous pixels.

2. The image producing device according to claim 1, wherein the deviation amount acquisition module acquires translational movement amount information that expresses translational deviation among images expressed by the plurality of sets of frame information on the basis of the plurality of sets of frame information, and the conversion module performs

conversion processing on the basis of the acquired translational movement  
amount information in which at least one of the plurality of sets of frame  
information is converted by causing at least one of the respective images  
expressed by the plurality of sets of frame information to perform a  
5 translational movement so that the translational deviation among images is  
reduced.

3. The image producing device according to claim 2, wherein the  
conversion module performs conversion processing on the basis of the  
10 rotation amount information and translational movement amount  
information in which the positions of the respective pixels in at least one of  
the plurality of sets of frame information are converted in units finer than  
the pixels so that the deviation of the images is reduced.

15 4. The image producing device according to claim 3, wherein the  
deviation amount acquisition module acquires the rotation amount  
information and translational movement amount information by  
determining the rotational deviation and translational movement deviation  
among the images using calculation formulae that determine the rotational  
20 deviation and translational movement deviation by the method of least  
squares on the basis of the positions of the pixels and the halftone data for  
the pixels in the plurality of sets of frame information.

5. The image producing device according to claim 1, wherein the  
25 synthesizing module produces the image data with a different number of  
pixels from that of the frame information.

6. The image producing device according to claim 5, wherein the synthesizing module produces the image data with a greater number of pixels than that of the frame information.

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7. The image producing device according to claim 1, wherein the frame acquisition module acquires first, second and third sets of frame information in time series order from the video information,

the deviation amount acquisition module acquires first rotation  
10 amount information that expresses the rotational deviation between the two images expressed by the first and second sets of frame information on the basis of the first and second sets of frame information, and acquires second rotation amount information that expresses the rotational deviation  
15 between the two images expressed by the second and third sets of frame information on the basis of the second and third sets of frame information, and

the conversion module performs conversion processing which converts the second set of frame information by rotating the image expressed by the second set of frame information on the basis of the first  
20 rotation amount information so that the rotational deviation between the image expressed by the second set of frame information and the image expressed by the first set of frame information is reduced, and which converts the third set of frame information by rotating the image expressed by the third set of frame information on the basis of the first rotation  
25 amount information and second rotation amount information so that the rotational deviation between the image expressed by the third set of frame

information and the image expressed by the first set of frame information is reduced.

8. The image producing device according to claim 1, wherein the  
5 synthesizing module produces the image data by performing specified interpolation processing from a plurality of sets of frame information on which the conversion processing has been performed.

9. The image producing device according to claim 8, wherein the  
10 synthesizing module performs the interpolation processing using halftone data for pixels that are present in the area surrounding a pixel of interest that produces the image data, among all of the pixels of the plurality of sets of frame information, while successively moving the pixel of interest, and produces the image data from the halftone data following this interpolation  
15 processing.

10. An image processing device comprising:

a frame acquisition module acquiring a plurality of sets of frame  
information from video information, wherein the video information  
20 comprises numerous sets of frame information, and the frame information expresses images as halftone data for numerous individual pixels; and

a synthesizing module which, in order to produce image data that  
expresses images in halftones using numerous pixels by synthesizing the  
plurality of sets of frame information, perform specified interpolation  
25 processing using halftone data for pixels that are present in the area surrounding a pixel of interest that produces the image data, among all of

the pixels of the plurality of sets of frame information, while successively moving the pixel of interest, and produces the image data from the halftone data following this interpolation processing.

5           11. The image producing device according to claim 9, wherein the synthesizing module performs the interpolation processing using halftone data for the pixel that is closest to the pixel of interest among all of the pixels of the plurality of sets of frame information.

10           12. The image producing device according to claim 10, wherein the synthesizing module performs the interpolation processing using halftone data for the pixel that is closest to the pixel of interest among all of the pixels of the plurality of sets of frame information.

15           13. The image producing device according to claim 11, wherein the synthesizing module performs the interpolation processing using frame information that includes the pixel closest to the pixel of interest among the plurality of sets of frame information.

20           14. The image producing device according to claim 12, wherein the synthesizing module performs the interpolation processing using frame information that includes pixels closest to the pixel of interest among the plurality of sets of frame information.

25           15. The image producing device according to claim 9, wherein the synthesizing module performs the interpolation processing using frame

information that includes pixels within a specified range based on the pixel of interest among the plurality of sets of frame information.

16. The image producing device according to claim 10, wherein the  
5 synthesizing module performs the interpolation processing using frame information that includes pixels within a specified range based on the pixel of interest as a reference among the plurality of sets of frame information.

17. The image producing device according to claim 9, wherein the  
10 synthesizing module performs the interpolation processing for each of the plurality of sets of frame information, and produces the image data from the respective halftone data following the interpolation processing.

18. The image producing device according to claim 10, wherein the  
15 synthesizing module performs the interpolation processing for each of the plurality of sets of frame information, and produces the image data from the respective halftone data following the interpolation processing.

19. An image deviation amount detection device comprising:  
20 a frame acquisition module acquiring a plurality of sets of frame information from video information, wherein the video information comprises numerous sets of frame information, and the frame information expresses images as halftone data for numerous individual pixels; and  
a deviation amount detection module detecting an amount of  
25 rotation that expresses the rotational deviation among the images expressed by the plurality of sets of frame information on the basis of the plurality of

sets of frame information.

20. An image production method comprising the steps of:

5 (a) acquiring a plurality of sets of frame information from video information comprising numerous sets of frame information expressing images as halftone data for numerous individual pixels;

(b) acquiring rotation amount information that expresses the rotational deviation among the images expressed by the plurality of sets of frame information on the basis of the plurality of sets of frame information;

10 (c) performing conversion processing, on the basis of the acquired rotation amount information, that converts at least one of the plurality of sets of frame information by rotating at least one of the respective images expressed by the plurality of sets of frame information so that the rotational deviation among the images is reduced; and

15 (d) producing image data that expresses images in halftones using numerous pixels by synthesizing a plurality of sets of frame information on which the conversion processing has been performed.

21. An image production method comprising the steps of:

20 (a) acquiring a plurality of sets of frame information from video information comprising numerous sets of frame information expressing images as halftone data for numerous individual pixels; and

(b) in order to produce image data that expresses images in halftones using numerous pixels by synthesizing the plurality of sets of frame information, performing specified interpolation processing using  
25 halftone data for pixels that are present in the area surrounding a pixel of

interest that produces the image information, among all the pixels of the plurality of sets of frame information, while successively moving this pixel of interest, and produces the image data from the halftone data following the interpolation processing.

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22. An image production method comprising the steps of:

(a) acquiring a plurality of sets of frame information from video information comprising numerous sets of frame information expressing images as halftone data for numerous individual pixels; and

10 (b) detecting an amount of rotation that expresses the rotational deviation among the images expressed by the plurality of sets of frame information on the basis of the plurality of sets of frame information.

23. A recording medium on which a computer program that is used  
15 in order to realize the following functions in a computer is recorded:

a frame acquisition function which acquires a plurality of sets of frame information from video information comprising numerous sets of frame information expressing images as halftone data for numerous individual pixels;

20 a deviation amount acquisition function which acquires rotation amount information that expresses the rotational deviation among the images expressed by the plurality of sets of frame information on the basis of the plurality of sets of frame information;

a conversion function which performs conversion processing, on the  
25 basis of the acquired rotation amount information, that converts at least one of the plurality of sets of frame information by rotating at least one of the



respective images expressed by the plurality of sets of frame information so that the rotational deviation among the images is reduced; and

a synthesizing function which produces image data that expresses images in halftones using numerous pixels by synthesizing a plurality of sets of frame information on which the conversion processing has been performed.

24. A recording medium on which a computer program that is used in order to realize the following functions in a computer is recorded:

10 a frame acquisition function which acquires a plurality of sets of frame information from video information comprising numerous sets of frame information expressing images as halftone data for numerous individual pixels; and

a synthesizing function which, in order to produce image data that expresses images in halftones using numerous pixels by synthesizing the plurality of sets of frame information, performs specified interpolation processing using halftone data for pixels that are present in the area surrounding a pixel of interest that produces the image information, among all the pixels of the plurality of sets of frame information, while successively moving this pixel of interest, and produces the image data from the halftone data following this interpolation processing.

25. A recording medium on which a computer program that is used in order to realize the following functions in a computer is recorded:

25 a frame acquisition function which acquires a plurality of sets of frame information from video information comprising numerous sets of

frame information expressing images as halftone data for numerous individual pixels; and

5 a deviation amount detection function which detects an amount of rotation that expresses the rotational deviation among the images expressed by the plurality of sets of frame information on the basis of the plurality of sets of frame information.